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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/679,701

10/03/2003

Allen Carroll

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EXAMINER

CHACKO DAVIS, DABORAH

ART UNIT

PAPER NUMBER

1756

MAIL DATE

DELIVERY MODE

05/18/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/679,701

**Applicant(s)**

CARROLL, ALLEN

**Examiner**

Daborah Chacko-Davis

**Art Unit**

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 11-16, and 20-22, are rejected under 35 U.S.C. 102(e) as being anticipated by U. S. Patent Application Publication No. 2006/0023182 (Novak et al., hereinafter referred to as Novak).

Novak, in the abstract, in [0004], [0024], [0026], [0027], [0035], [0036], [0045], [0046], [0048], [0051], [0063], [0099], discloses an immersion lithography system that patterns the photoresist coated wafer (wafer with a layer sensitive to em radiation), by using an illumination source (reference 14 of figure 1) to emit the radiation onto the wafer via a reticle (radiation emitted to an object plane via the mask positioned in said object plane), providing an immersion fluid in a gap provided in the imaging field, wherein the gap includes the area between the optical assembly and the wafer (thereby a portion of the fluid is in contact with the optical assembly (includes objective lens) and the wafer), and the immersion fluid is supplied from an immersion fluid system (immersion fluid reservoir, reference 252, figure 2B) through an injector nozzle (orifice,

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reference 258, of figure 2B), wherein the injector nozzle is part of the optical housing (reference 250 A of figure 2B), and the fluid transport region (both references 246, and 256) convey the immersion via capillary action and the passages of the fluid flow are so small that they cause capillary forces to act on the fluid, and therefore have areas of contacting (in the gap between the wafer and the optical assembly) limited by the capillary forces (claims 11, and 20-21). Novak, in [0032], discloses that the illumination source can be an excimer laser (claim 12). Novak, in [0051], discloses that the immersion fluid supplying portion (injector nozzle) is a porous portion (reference 258 of figure 2C) (claims 13, and 22). Novak, in [0077], [0079], discloses a fluid removal system to remove the immersion fluid thorough an orifice that is porous (see figure 3C) (claims 14-15). Novak, in [0087], [0088], [0089], [0090], discloses that the porous material is in communication with the fluid transport region (incoming immersion fluid) and the nozzle outlet (both references 578A and 578B) and is therefore incompletely saturated (claim 16).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-10, 17-19, and 23-28, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent Application Publication No. 2006/0023182 (Novak et al.,

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hereinafter referred to as Novak) in view of U. S. Patent Application Publication No. 2003/0123040 (Almog).

Novak, in the abstract, in [0004], [0024], [0026], [0027], [0035], [0036], [0045], [0046], [0048], [0051], [0063], [0099], discloses an immersion lithography system that patterns the photoresist coated wafer (wafer with a layer sensitive to em radiation), by using an illumination source (reference 14 of figure 1) to emit the radiation onto the wafer via a reticle (radiation emitted to an object plane via the mask positioned in said object plane), providing an immersion fluid in a gap provided in the imaging field, wherein the gap includes the area between the optical assembly (optical assembly includes objective lens) and the wafer (thereby a portion of the fluid is in contact with the optical assembly and the wafer), and the immersion fluid is supplied from an immersion fluid system (immersion fluid reservoir, reference 252, figure 2B) through an injector nozzle (orifice, reference 258, of figure 2B), wherein the injector nozzle is part of the optical housing (reference 250 A of figure 2B), and the fluid transport region (both references 246, and 256) convey the immersion via capillary action and the passages of the fluid flow are so small that they cause capillary forces to act on the fluid, and therefore have areas of contacting (in the gap between the wafer and the optical assembly) limited by the capillary forces (claims 1, 17-18, 23-26, and 28). Novak, in [0032], discloses that the illumination source can be an excimer laser (claim 6). Novak, in [0051], discloses that the immersion fluid supplying portion (injector nozzle) is a porous portion (reference 258 of figure 2C) (claims 7, 19, and 27). Novak, in [0077], [0079], discloses a fluid removal system to remove the immersion fluid thorough an

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orifice that is porous (see figure 3C) (claims 8-9). Novak, in [0087], [0088], [0089], [0090], discloses that the porous material is in communication with the fluid transport region (incoming immersion fluid) and the nozzle outlet (both references 578A and 578B) and is therefore incompletely saturated (claim 10).

The difference between the claims and Novak is that Novak does not disclose that a modulator is adapted to modulate and relay the electromagnetic radiation, in accordance to an input pattern description, to the workpiece. Novak does not disclose that the modulator is an SLM, and includes reflective pixels such as micromirrors (claims 2-4). Novak does not disclose that the modulator is an acousto-optical modulator (claim 5).

Almogy, in [0011], [0017], [0031], and [0032], discloses using a modulator that modulates light (electromagnetic radiation) in response to an input signal provided by a programmable image generator, wherein the modulator is a spatial light modulator that comprises pixels (micromirrors). Almogy, in [0058], and [0060], discloses using rotating mirrors (changing the angle of the mirrors to change the angle of the light in the focusing optics) to modulate the light beams and to focus the light beams onto the resist.

Therefore, it would be obvious to a skilled artisan to modify Novak by replacing the mask with a light modulator as suggested by Almogy because Almogy, in [0038], discloses that employing the suggested modulating lens is less expensive and requires no magnification.

***Response to Arguments***

5. Applicant's arguments filed February 15, 2007, have been fully considered but they are not persuasive. The 102 and 103 rejections made in the previous office action (paper no. 20061011) are maintained.

A) Applicants argue that the provisional applications viz., 60/462,112, and 60/485,033 do not support the passages relied upon in the Novak reference..

The Novak reference relies upon both the provisional applications. Additionally, the '112 provisional illustrates the same immersion lithographic system relied in Novak, see figures 1, and 6 of the '112 provisional. Also, the specification of the '033 provisional, on pages 2, and 3, teach the claimed immersion lithographic system.

B) Applicants argue that the '033 provisional teaches continuous evacuation of the channel C and that Novak in [0004] teaches avoiding the use of direct vacuum.

The '033 provisional does not teach vacuuming the port that supplies the fluid to the gap between the lens and the wafer (see figure 1 of '033 provisional, channel A). Page 2, of the '033 provisional, teaches that channel A is the port (part of the immersion optics housing) that supplies immersion fluid and is similar to the reference 258, of figure 2B, relied upon in the Novak reference. The port referred to by the applicant, viz., channel C is not an immersion fluid supply port. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., avoiding the direct use of vacuum) are not recited in the rejected claim(s). Although the claims are interpreted in light of the

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specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

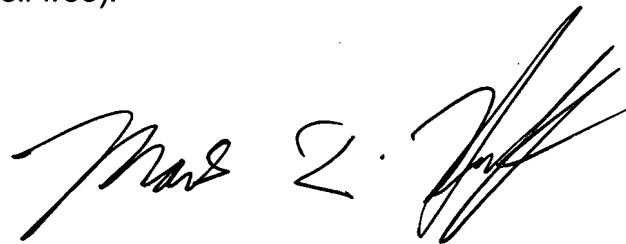
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent

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Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

  
May 10, 2007.



MARK F. HUFF  
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